THE INVENTION CLAIMED IS

1. An orthogonal acceleration time-of-flight mass spectrometer comprising:

an external ion source for producing ions;

a space in which said ions are directed;

an ion reservoir consisting of a repeller plate and grids that are placed on the opposite sides of said space to accelerate the ions in a pulsed manner out of the space;

a time-of-flight mass spectrometric portion for mass separating the ions taken out of the ion reservoir via its internal grids;

an ion detector for detecting the mass-separated ions; and

heating means for heating said repeller plate.

2. The orthogonal acceleration time-of-flight mass spectrometer of claim 1, wherein said heating means also heats focusing lenses and a slit mounted between the external ion source and the ion reservoir, in addition to the grids.

3. The orthogonal acceleration time-of-flight mass spectrometer of claim 1 or 2, wherein said heating means is placed on the opposite side of the repeller plate from the ion reservoir through which the ions pass, and wherein said heating means provides indirect radiative heating.

4. The orthogonal acceleration time-of-flight mass spectrometer of claim 1 or 2, wherein said heating means is one of a heater and a lamp.

5. The orthogonal acceleration time-of-flight mass spectrometer of claim 4, wherein said heater is formed by stretching a metal wire in a zigzag fashion adjacent a metal plate.

6. The orthogonal acceleration time-of-flight mass spectrometer of claim 5, wherein said metal wire is mounted over said metal plate via insulators and is not in direct contact with said metal plate.

7. The orthogonal acceleration time-of-flight mass spectrometer of claim 5, wherein said metal wire is made of a metal showing low vapor pressures at high temperatures such as tantalum, platinum, or tungsten.

8. The orthogonal acceleration time-of-flight mass spectrometer of claim 6, wherein said metal wire is made of a metal showing low vapor pressures at high temperatures such as tantalum, platinum, or tungsten.

9. The orthogonal acceleration time-of-flight mass spectrometer of claim 4, wherein said heater may be heated to 100-1,000°C.

10. The orthogonal acceleration time-of-flight mass spectrometer of claim 1, wherein a temperature sensor is mounted close to said heating means.

11. The orthogonal acceleration time-of-flight mass spectrometer of claim 10, wherein said temperature sensor is a thermocouple.

12. The orthogonal acceleration time-of-flight mass spectrometer of claim 8 or 9, wherein a signal from said temperature sensor is fed back to a power supply that energizes said heating means.